

Prepared by the expert from Germany

**Information for the experts of GRSG of a proposal to amend Directive 2000/8/EC (70/221/EEC), relating to fuel tanks (and rear underrun protection).**

In order to resolve additional problems of the EC- Directive 2000/8, the below mentioned proposal has been prepared by the expert from Germany to amend the EC-Directive.

As it is provided to amend ECE-Regulation 34 during the WP.29 session in November 2002, Germany wants to inform the experts of GRSG about the proposed amendments.

The below described proposal also relates to ECE-Regulation 34.

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**Proposals**

1. to amend Directive 2000/8/EC (Basic Directive 70/221/EEC), and
2. to correct a translation error in 70/220/EEC (German language only), where 2000/8/EC relates to

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Directive 70/221/EEC in its version 2000/8/EC has been established as a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 March 2000 relating to liquid fuel tanks and rear underrun protection of motor vehicles and their trailers

The below mentioned proposals have been prepared by Germany to amend the existing text of the Directive because of technical reasons and/or to avoid misinterpretations relating to annex 1 of the Directive:

- Item 1:** Paragraphs 5.9.1. and 5.9.1.1. "Fixation and securing of filler caps" and correction of German translation in 70/220/EEC, annex I, paragraph 5.1.3.
- Item 2:** Paragraph 5.11. "Avoidance of static electricity charges"
- Item 3:** Paragraph 6.2. "Overturn test"
- Item 4:** Paragraph 6.3.2. "Mechanical strength - test in a test fixture - "
- Item 5:** Paragraph 6.3.3. "Fuel permeability"

**To item 1:**

Existing text of paragraphs 5.9.1. and 5.9.1.1.:

- 5.9.1. The tank cap must be fixed to the filler pipe. The seal must be retained securely in place, the cap must latch securely in place against the seal and filler pipe when closed.
- 5.9.1.1. The requirements of Section 5.9.1. will be deemed to be satisfied if the vehicle meets the requirements of Section 5.1.3. of Annex I to Directive 70/220/EEC (<sup>1</sup>), subject to the provision that the examples listed in the third intend of that section do not apply to vehicles in categories other than M1 and N1.

Proposed modification:

- 5.9.1. The tank cap must be fixed to the filler pipe.
- 5.9.1.1. The requirements of paragraph 5.9.1. will be deemed to be satisfied if provision is made to prevent excess evaporative emissions and fuel spillage caused by a missing fuel filler cap.  
  
This may be achieved using one of the following:
  - 5.9.1.1.1. an automatically opening and closing, non-removable fuel filler cap,
  - 5.9.1.1.2. design features which avoid excess evaporative emissions and fuel spillage in the case of a missing fuel filler cap,
  - 5.9.1.1.3. any other provision which has the same effect. Examples may include, but are not limited to, a tether filler cap, a chained filler cap or one utilising the same locking key for the filler cap and for the vehicle's ignition. In this case, the key shall be removable from the filler cap only in the locked condition.  
However, use of a tethered or chained filler cap by itself is not sufficient for vehicles other than M 1 and N1.

*Replace the second sentence of the existing version of 5.9.1. to a new paragraph 5.9.2., which shall be read as:*

- 5.9.2. The seal must be retained securely in place. The cap must latch securely in place against the seal and filler pipe when closed.

*General remark:*

*Even if the Commission follows the above mentioned proposal, it is highly requested to modify Directive 70/220/EEC, Annex I, paragraph 5.1.3., where the existing text of Directive 2000/8/EC relates to. Correction should be made in the **German version only**. The English term "fuel" has been translated into the German wording "Benzin". The correct translation of "**fuel**" is "**Kraftstoff**" instead of "Benzin".*

*70/220/EEG, Annex I, paragraph 5.1.3. has to be read as **(German version)**:*

*Überhöhte Verdunstungsemissionen und Überlaufen von **Kraftstoff** aufgrund eines fehlenden Tankdeckels müssen vermieden werden. Dazu kann eine der nachfolgenden Vorkehrungen getroffen werden: . . . . .*

Justification:

1. The existing text of the Directive leads to misinterpretations and should be amended by provisions as described in the proposal to amend ECE-R 34 (see TRANS/WP.29/2002/14), which is on the agenda of the WP.29 meeting in November 2002.
2. In addition, a modification of the German translation of paragraph 5.1.3. Annex I of Directive 70/220/EEC is highly requested.

**To item 2:**

Existing text of paragraph 5.11.:

- 5.11. The fuel tank and the filler neck shall be designed and installed in the vehicles in such a way as to avoid any accumulation of static electricity charges on their entire surface. If necessary, they shall be discharged into the metallic structure of the chassis or any major metallic mass by means of a good conductor.

Proposed modification:

- 5.11. The fuel tank and the filler neck shall be designed and installed in the vehicles in such a way as to avoid any **dangerous** accumulation of static electricity charges. If necessary, **measures for dischargement shall be provided.**  
**The manufacturer shall demonstrate to the Technical Service the measures which guarantee a sufficient avoidance of dangerous electricity charges of the tank, the filler neck and their installation.**

Justification:

*Because of the lack of named standards for measuring and evaluation of accumulation of static electricity charges on the surfaces of tanks and their accessories it is the responsibility of the manufacturer to demonstrate and to show that a sufficient dischargement measure is provided to avoid any dangerous accumulation of static electricity.  
We recommend to develop as soon as possible a practical test standard to measure and to evaluate dangerous accumulation of static electricity.*

**To item 3:**

Existing text of paragraph 6.2.of the Directive:

- 6.2. Overturn test
- 6.2.1. The tank and all its accessories must be mounted on to a test fixture in a manner corresponding to the mode of installation on the vehicle for which the tank is intended: this also applies to systems for the compensation of the interior excess pressure.
- 6.2.2. The test fixture shall rotate about an axis lying parallel to the longitudinal vehicle axis.

- 6.2.3. The test will be carried out with the tank filled to 90% of its capacity and also 30% of its capacity with a non-flammable liquid having a density and a viscosity close to those of the fuel normally used (water may be accepted).
- 6.2.4. The tank must be turned from its installed position 90° to the right. The tank must remain in this position for at least five minutes. The tank must then be turned 90° further in the same direction. The tank must be held in this position, in which it is completely inverted, for at least another five minutes. The tank must be rotated back to its normal position. Testing liquid which has not flowed back from the venting system into the tank must be drained and replenished if necessary. The tank must be rotated 90° in the opposite direction and left for at least five minutes in this position.  
The tank must be rotated 90° further in the same direction. This completely inverted position must be maintained for at least five minutes. Afterwards the tank must be rotated back to its normal position.

*Add a new requirement into paragraph 6.2 4. describing the rotation time rate in accordance with FMVSS 301, described as follows.*

The rotation rate for each successive increment of 90° shall take place in any time interval from 1 to 3 minutes.

Justification:

*The rotation rate influences the strength of the test. To guarantee a uniform test procedure a fixation of a rotation rate is essential.*

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*Below you can find a copy of the relevant text of FMVSS 301, S 7.4:*

[Code of Federal Regulations] [Title 49, Volume 5, Parts 400 to 999] [Revised as of October 1, 2000] From the U.S. Government Printing Office via GPO Access [CITE: 49CFR571.301] [Page 724-729] TITLE 49--TRANSPORTATION CHAPTER V--NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION PART 571--FEDERAL MOTOR VEHICLE SAFETY STANDARDS--Table of Contents Subpart B--Federal Motor Vehicle Safety Standards Sec. 571.301 Standard No. 301; **Fuel system integrity.**

**S 7.4 Static rollover test conditions**

The vehicle is rotated about its longitudinal axis, with the axis kept horizontal, to each successive increment of 90 deg., 180 deg. and 270 deg. at a uniform rate, with 90 deg. of rotation taking place in any time interval from 1 to 3 minutes. After reaching each 90 deg. increment the vehicle is held in that position for 5 minutes.

**To item 4:**

Existing text of paragraph 6.3.2.:

6.3.2. Mechanical strength

The tank must be tested under the conditions prescribed in Section 6.1. for leaks and for rigidity of shape. The tank and all its accessories must be mounted onto a test fixture in a manner corresponding to the mode of installation on the vehicle for which the tank is intended.

Water at 326 K (53°C) must be used as the testing fluid and must fill the tank to its capacity. The tank must be subjected to a relative internal pressure equal to double the working pressure and in any case to not less than 0,3 bar at a temperature of 326 K ± 2 K (53°C ± 2°C) for a period of five hours. During the test, the tank and its accessories must not crack or leak; however, it may be permanently deformed.

Proposed modification:

6.3.2. Mechanical strength

The tank must be tested under the conditions prescribed in Section 6.1. for leaks and for rigidity of shape. The tank and all its accessories must be mounted onto a test fixture in a manner corresponding to the mode of installation on the vehicle for which the tank is intended **or mounted in the vehicle itself or mounted in a test fixture made by a vehicle section. On request of the manufacturer and with the agreement of the Technical Service the tank may be tested without using any test fixture.**

Water at 326 K (53°C) must be used as the testing fluid and must fill the tank to its capacity. The tank must be subjected to a relative internal pressure equal to double the working pressure and in any case to not less than 0, 3 bar at a temperature of 326 K ± 2 K (53°C ± 2°C) for a period of five hours. During the test, the tank and its accessories must not crack or leak; however, it may be permanently deformed.

Justification:

*The existing wording requires a test fixture in a manner corresponding to the mode of the installation of the vehicle for which the tank is intended.*

*The proposed text allows clearly the use of the vehicle itself or a vehicle section as a test fixture. In many cases, the test of a tank, not fixed, is the most unfavourable test condition and this test condition should be allowed with the agreement of the Technical Service instead of the use of a test fixture.*

**To item 5:**

Existing text of paragraph 6.3.3. of annex III of the Directive:

6.3.3. Fuel permeability

6.3.3.1. The fuel used for the permeability test must be either the reference fuel specified in Annex VIII to Directive 70/220/EEC or a commercial premium-grade fuel. If the tank is only designed for installation on vehicles with a compression-ignition engine, the tank shall be filled with diesel fuel.

- 6.3.3.2. Prior to the test, the tank must be filled to 50% of its capacity with testing fuel and stored, without being sealed, at an ambient temperature of  $313\text{ K} \pm 2\text{ K}$  ( $40^\circ\text{C} \pm 2^\circ\text{C}$ ) until the weight loss per unit time becomes constant.
- 6.3.3.3. The tank must then be emptied and refilled to 50% of its capacity with test fuel, after which it must be hermetically sealed and be stored at a temperature of  $313\text{ K} \pm 2\text{ K}$  ( $40^\circ\text{C} \pm 2^\circ\text{C}$ ). The pressure must be adjusted when the contents of the tank have reached the testing temperature. During the ensuing test period of eight weeks, the loss of weight due to diffusion during the test period shall be determined. The maximum permissible average loss of fuel is 20 g per 24 hours of testing time.
- 6.3.3.4. If the loss due to diffusion exceeds the value indicated in section 6.3.3.3., the test described there must be carried out again on the same tank to determine the loss by diffusion at  $296\text{ K} \pm 2\text{ K}$  ( $23^\circ\text{C} \pm 2^\circ\text{C}$ ) but under the same conditions otherwise. The loss so measured shall not exceed 10 g per 24 hours.

Proposed modification:

- 6.3.3. Fuel permeability
- 6.3.3.1. The fuel used for the permeability test must be either the reference fuel specified in Annex **IX** to Directive 70/220/EEC or a commercial premium-grade fuel. If the tank is only designed for installation on vehicles with a compression-ignition engine, the tank shall be filled with diesel fuel.
- 6.3.3.2. Prior to the test, the tank must be filled to 50% of its capacity with testing fuel and stored, without being sealed, at an ambient temperature of  $313\text{ K} \pm 2\text{ K}$  ( $40^\circ\text{C} \pm 2^\circ\text{C}$ ) until the weight loss per unit time becomes constant, **but for not more than four weeks (preliminary storage time)**.
- 6.3.3.3. The tank must then be emptied and refilled to 50% of its capacity with test fuel, after which it must be hermetically sealed and be stored at a temperature of  $313\text{ K} \pm 2\text{ K}$  ( $40^\circ\text{C} \pm 2^\circ\text{C}$ ). The pressure must be adjusted when the contents of the tank have reached the testing temperature. During the ensuing test period of eight weeks, the loss of weight due to diffusion during the test period shall be determined. The maximum permissible average loss of fuel is 20 g per 24 hours of testing time.
- 6.3.3.4. If the loss due to diffusion exceeds the value indicated in section 6.3.3.3., the test described there must be carried out again on the same tank to determine the loss by diffusion at  $296\text{ K} \pm 2\text{ K}$  ( $23^\circ\text{C} \pm 2^\circ\text{C}$ ) but under the same conditions otherwise. The loss so measured shall not exceed 10 g per 24 hours.

Justification:

1. Reference fuel is specified in the last version of Directive 70/220/EEC in Annex **IX** ( instead of Annex VIII).
2. An open tank (not sealed) filled to 50% of the maximum capacity can never reach a weight loss which becomes constant per unit time UNTIL THE TANK IS COMPLETELY EMPTY.  
This requirement makes physically no sense. Therefore it is important to keep the requirement as it is described in the existing text of ECE-Regulation 34!!!